

## Descriptions and distributional records of African Mecoptera\*

by

GEORGE W. BYERS

Department of Entomology,  
University of Kansas, Lawrence, Kansas

Introduced by J. G. Londt

New species *Bittacus erythrostigma* from Zaïre (Congo) and Uganda and *Bittacus luxeni* from Guinea are described and illustrated. Ranges of other species are extended by new distributional records.

Since publication of my illustrated, annotated catalogue of African Mecoptera (1971), I have received for identification some further specimens from Africa, including representatives of two undescribed species. For the opportunity to study these materials, I wish to thank Dr Borge Petersen and Dr S. L. Tuxen of the Universitetets Zoologiske Museum, Copenhagen, and Dr Paul H. Arnaud, Jr, of the California Academy of Sciences, San Francisco. I also acknowledge with thanks the financial support of my work on Mecoptera by the National Science Foundation, through grant GB-30837.

### *Bittacus erythrostigma* spec. nov., figs 1-3

Description based on one male and one female, pinned.

*Head.* Eyes black; vertex, occiput, frons and base of rostrum unevenly dark amber-brown except black around bases of ocelli; apical two-thirds of rostrum, mandibles, maxillary and labial palps light amber. Antennal scape and pedicel reddish brown, flagellum yellowish brown, with 21 short-haired flagellomeres. Antennal length about 12 mm.

*Thorax.* Dorsum, pleural surfaces and coxae sordid light reddish brown; posterodorsal corner of mesothoracic and metathoracic mera blackened. Two slender setae at each side on anterior margin of pronotum, and two near posterior margin, above spiracle. Convergent, paired setae on mesonotal and metanotal scutella. Sparse yellowish hairs on sides, most numerous on epimera and anterior surfaces of coxae. Legs and tarsi dark yellowish brown throughout. Hind femora not thickened in either sex.

Wings (fig. 1) tinged with yellowish brown, darkened at subfalcate apex and along

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\* Contribution No. 1576 from the Department of Entomology, University of Kansas, Lawrence, Kansas 66045, U.S.A.

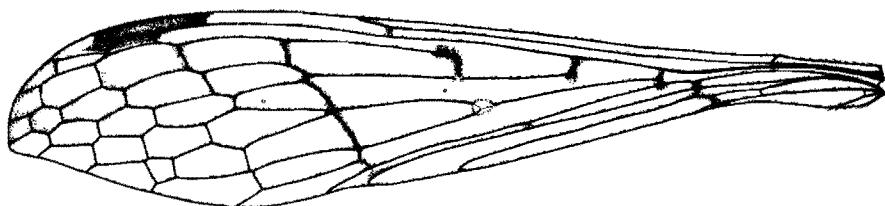


Fig. 1. *Bittacus erythrostigma* spec. nov., left front wing of male holotype. Length 24 mm.

many cross-veins, with more conspicuous spots at origin of M from Cu, at origin of Rs, and along abruptly curved base of  $R_{2+3}$ . Stigmata of all wings translucent dark red, with small apical prolongation. Whitish thyridium at first fork of M surrounded by dark shading. No apical cross-vein between  $Cu_2$  and 1A; two pterostigmal cross-veins. Subcostal cross-vein well beyond first fork of Rs in all wings. Veins  $R_1$  and  $R_2$  unbranched in front wings, fused to tip in hind wings. Cellules small near wing tip, their pattern not uniform in right and left wings of an individual.

*Abdomen of male.* General coloration light reddish brown, a little darker on segments 7–9, narrowly blackened at posterior margins of terga; no spines on lateral margins of anterior terga. Basistyles reddish brown at base, yellowish brown at apex. Epiandrial lobes of ninth tergum blackish brown (discolored in holotype?), extending slightly beyond end of fused basistyles, widest near base, narrowed and curved inward and downward beyond mid-length (fig. 2). Tips of epiandrial lobes somewhat twisted so mesal concavity becomes dorsal (fig. 3); no spines on apex or margins. A sinuate, diagonal ridge on mesal surface of each lobe in apical one-third; on inner surface near base a blackened, smooth, conical projection with small hairs at its apex (fig. 3). Aedeagus thick in basal half, tapering to slender tip, short, not coiled but simply recurved. Cerci extending nearly to bases of dististyles (bent upward from extremely shriveled and retracted proctiger, in holotype).

Body length, male, about 27.4 mm; front wing 24.0 mm.

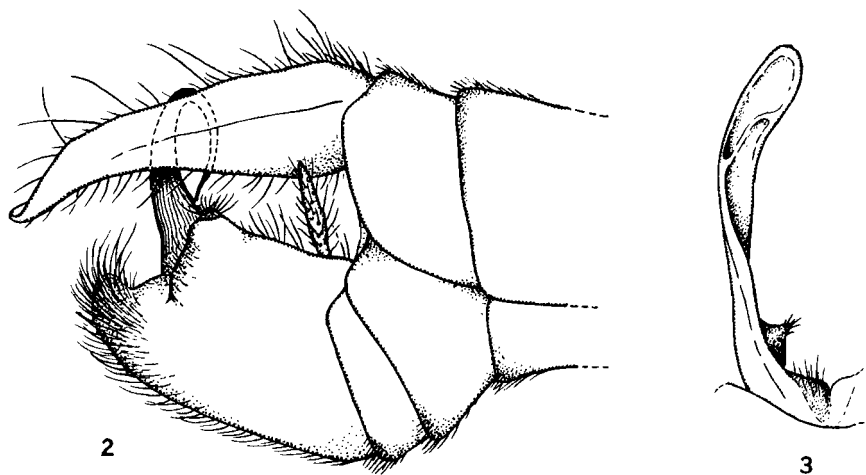
The female specimen is badly damaged, especially about the head and thorax, apparently by partial decomposition, but its wings and legs are intact. Length of the fore wing is 21.5 mm. I am indebted to Dr Jason G. H. Londt of Rhodes University, Grahamstown, for calling to my attention the existence of this female specimen.

**MATERIAL EXAMINED.** Holotype, ♂, Kafko, north of Rutshuru, eastern Kivu, Zaïre (Congo), 12 December 1946, University Central African Expedition 1946–47 (Station 5); in the Universitetets Zoologiske Museum, Copenhagen, Denmark. The type locality is between Lake Edward and Lake Kivu, about  $1^{\circ} 11'S$ ,  $29^{\circ} 27'E$ , elevation approximately 1200 m. Allotype, ♀, taken in light trap at Kawanda, Uganda (approximately  $0^{\circ} 26'N$ ,  $32^{\circ} 32'E$ ), 13 April 1972, by D. Greathead; in Londt collection, Rhodes University, Grahamstown, South Africa. The Kawanda locality is just north of Kampala.\*

\* Since this paper was type-set, a second male of *B. erythrostigma* has been discovered by Dr J. G. H. Londt. It was collected by J. T. Medler at Kenne, Western Region, Nigeria, in September 1974. It agrees with the holotype except in having 4–5 short, black spines on the inner margin of each epiandrial lobe near the apex and in having the apical portions of the lobes less twisted. It also reveals a simple proctiger with cerci in the usual position, and that the dark colour of the epiandrial lobes is normal, not discoloration. I regard this male as a paratype.

*Bittacus erythrostigma* most closely resembles *B. stanleyi* Byers, which species also occurs in eastern Kivu and has yellowish brown, subfalcate wings with brown-bordered cross-veins. However, its wings are less darkly tinged than those of *stanleyi*, the color and shape of the stigma are strikingly different, and the apical cross-vein is absent in *erythrostigma*, present in *stanleyi*. In wingspan, *erythrostigma* is the smaller by 8 mm or more, although it has a longer, more slender body than *stanleyi*. In genitalial structure, *erythrostigma* resembles both *stanleyi* and *B. weelei* Esben-Petersen but differs from both these species most notably in the shape of the epiandrial lobes and in lacking thick, black spines near the tips of the lobes. The holotype lacks the right front tarsus and right middle leg, and has a number of moth scales tightly adhering to it (suggesting it was taken in a light trap), but it is otherwise a fine specimen.

The specific name refers to the dark almost ruby red stigmata of the wings, a characteristic unique among known bittacids and found elsewhere among the Mecoptera only in *Panorpa rufostigma* Westwood of Balkan Europe.



Figs 2–3. *Bittacus erythrostigma* spec. nov., male holotype. 2. Terminal abdominal segments, right lateral aspect. 3. Right epiandrial lobe, dorsal aspect.

### *Bittacus tuxeni* spec. nov., figs 4–7

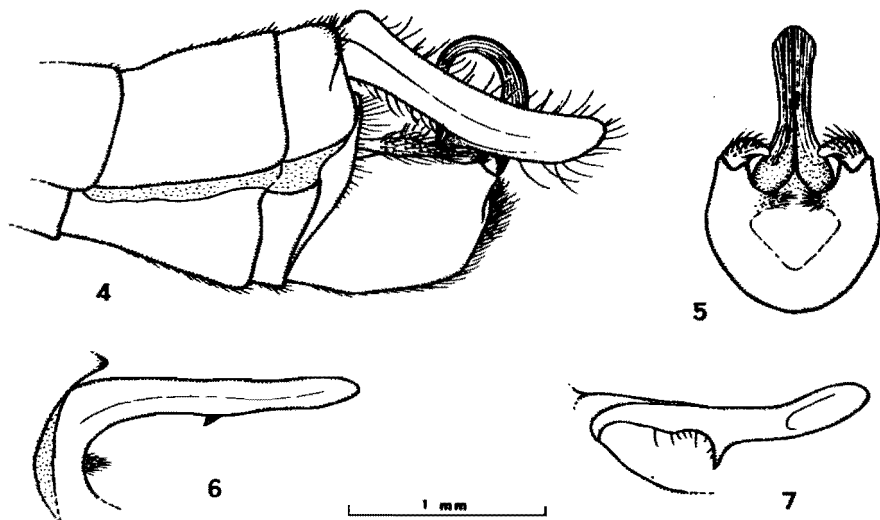
Description based on four males and one specimen without abdomen, all pinned.

**Head.** Dark amber brown, except blackish brown around bases of ocelli, on narrowly triangular genal prolongations below eyes, and at apex of rostrum. Antennae dark yellowish brown throughout, scape and pedicel somewhat shiny, flagellum with 22 or 23 short-haired flagellomeres. Antennal length (holotype) approximately 9.6 mm.

**Thorax.** Dorsum, pleural areas and coxae all unevenly dull dark yellowish brown. One stout black seta on low, rounded elevation at each side on anterior margin of pronotum, and one at each side on posterior margin, just above spiracle. A pair of paler, more slender,

convergent setae on posterior margin of mesoscutellum. Two or three prominent, black setae and numerous hairs on anterior surface of each fore coxa, two such setae on each hind coxa, and occasionally one on upper mesepimeron (not present in holotype). Legs dark yellowish brown, tarsi only slightly darker. Femora and tibiae narrowly darkened at tips. Hind femora of male only a little incrassate. (Right front and hind legs missing from holotype.)

Wings tinged with dull, smoky yellowish brown, without darkening along any veins or cross-veins; stigma scarcely darker than ground-color. Thyridium at first fork of M faintly evident. Apical cross-vein present between  $Cu_2$  and 1A; two pterostigmal cross-veins. Subcostal cross-vein before first fork of Rs (FRs), near mid-length of Rs in front wings, nearer base of Rs in hind wings. Subcosta joins costa well beyond FRs.



Figs 4-7. *Bittacus luxeni* spec. nov., male holotype. 4. Terminal abdominal segments, left lateral aspect. 5. Fused basistyles, dististyles and aedeagus, posterior aspect. 6. Right epiandrial lobe, dorsal aspect. 7. Right epiandrial lobe, left dorsolateral (nearly mesal) aspect. Most non-peripheral hairs omitted from all figures. Fig. 7 modified from male paratype.

**Abdomen of male.** General color dark yellowish brown throughout, darkened on acrotergites of some segments (not consistent from one specimen to another); a few black setae irregularly spaced along lateral margins of terga 2 and 3. Eighth tergum broadly bilobed in dorsal aspect. Epiandrial lobes of ninth tergum in lateral aspect of about uniform width from base to near apex, curved slightly upward beyond mid-length (fig. 4), extending approximately one-third of their length beyond basistyles; tips of lobes only slightly divergent in dorsal aspect (not noticeably so in holotype). Near mid-length of each epiandrial lobe, on lower mesal surface, an acute spine-like (but not darkened) projection directed downward and slightly mesad (figs 6, 7). Apical one-third of lobe shallowly concave on inner surface (fig. 7). Aedeagus simply recurved, bulbous at base, constricted slightly above level of dististyles (fig. 5), then flattened and widened dorsally, in lateral aspect appearing to taper almost evenly from base to tip (fig. 4). Subtriangular, shallow impression

in fused basistyles beneath aedeagal base (fig. 5). Cerci acute at apex. Protiger small, concealed. Dististyles curved and evenly narrowed to somewhat flattened tips.

Body length about 17 mm; front wing 18.2 to 19.0 mm (holotype 18.3 mm).

Female unknown.

**MATERIALEXAMINED.** Holotype, ♂, N'Zérékoré, Guinea (then French Guinea), 1 May 1951, collected by Svend Herold Olsen. Paratypes, 3 ♂ and 1 without abdomen, all collected by S. H. Olsen at the type locality, on 12 March 1952 (damaged specimen), 11 and 23 April 1950, and 13 October 1951. The type locality, N'Zérékoré, is in southernmost Guinea, near the border of Liberia, at 7° 45' N, 8° 49' W. Holotype and 3 paratypes in the Universitetets Zoologiske Museum, Copenhagen; one paratype in the Snow Entomological Museum, University of Kansas, Lawrence, Kansas. I have included the damaged specimen among the paratypes because its wings have been spread and show the venation better than do the other individuals.

*Bittacus tuxeni* closely resembles *B. homburgerae* Navás, which was also described from Guinea (vicinity of Mamou). Although *B. homburgerae* is known from its holotype only (and possibly one additional female) and *B. tuxeni* only from its five types, I think two distinct species are represented by these few specimens. The epiandrial lobes seem to offer the best means of differentiating these species. They have rather straight upper and lower margins but are curved markedly outward towards the apex in *homburgerae* (see Byers, 1971, figs 24, 25); in contrast, they have decidedly curved margins in lateral aspect but are not particularly divergent apically in *tuxeni* (figs 4, 6). In *homburgerae* they are also noticeably longer in relation to the length of the fused basistyles. This can be expressed as a ratio of length of epiandrial lobe (measured from hind margin of eighth tergum to tip) to length of basistyle (measured along its upper margin from edge of ninth sternum to posterior apex at base of dististyle). The ratio in *homburgerae* is 2.4 to 1, while in *tuxeni* it is only 2 to 1.

The projection from the ventromesal surface of the epiandrial lobe is bluntly rounded in *homburgerae*, with a small setose point on its anterior margin, and it is at about one-third (33.7%) the distance from base to apex of the entire lobe. The corresponding projection in *tuxeni* is sharply pointed, has no irregularities or tufts of setae on its margins, and is nearer mid-length (42.7% of length from base) of the epiandrial lobe.

Dates of collection of *B. tuxeni* suggest there may be two annual generations.

This species is named for Dr S. L. Tuxen, noted authority on Protura and other insects and non-insect arthropods. His generous hospitality during my visits to his Museum in Copenhagen is remembered with much appreciation.

#### DISTRIBUTIONAL RECORDS

##### *Bittacus discors* Navás

KENYA: Machakos District, 5 miles E of Simba, 3 300 ft., 27 Dec. 1969, M. Irwin and E. S. Ross – 12 ♂, 6 ♀ (California Academy of Sciences). This species had previously been known only from its two syntypes from Kenya and the holotype of its synonym, *B. patrizii* Navás, from Somalia.

##### *Bittacus fumosus* Esben-Petersen

KENYA: Machakos District, 5 miles E of Simba, 3 300 ft., 27 Dec. 1969, M. Irwin and E. S. Ross – 10 ♂, 15 ♀ (CAS). Males in this series show much variation in

the position of the elongate proctiger, from that seen in the supposed male of *fumosus* to the much more exerted condition seen in the holotype of *B. alluaudi* Navás (Byers, 1971, figs. 1971, figs 9, 21). There is also variation in the lateral aspect of the epiandrial lobes. Several individuals of both sexes have two subcostal cross-veins, usually both before the level of the FRs. On the basis of wing venation, coloration of wings and body, and male genital structure, I now consider *B. alluaudi* Navás and its synonyms, *B. jeanneli* Navás and *B. zavattarii* Capra, to be synonyms of *B. fumosus*. There remains the possibility, of course, that males identified as *fumosus* are not conspecific with the holotype of that species, which was described without abdomen.

**RHODESIA** (then Southern Rhodesia): 17 miles SE of Chirundu, 520 m, 8 Mar. 1958, E. S. Ross and R. Leech - 1 ♂ (CAS). **TANZANIA** (then Tanganyika): 32 miles SE of Sumbawanga, 1 590 m, 13 Feb. 1958, Ross and Leech - 1 ♂ (CAS). **ZAMBIA** (then Northern Rhodesia): Chilanga, 3 Jan. 1959, P. Johnsen - 1 ♀, 1 without abdomen and identified with some doubt (Universitetets Zoologiske Museum).

#### *Bittacus stanleyi* Byers

**ZAÏRE** (then Belgian Congo): Lwiro River, 47 km N of Bukavu, 1 950 m, 15 Dec. 1957, Ross and Leech - 2 ♂, 1 ♀ (CAS).

#### *Bittacus weelei* Esben-Petersen

**ANGOLA**: 4 miles S of Sa da Bandeira, 1 630 m, 9 Dec. 1966, E. S. Ross and K. Lorenzen - 2 ♂, 1 ♀ of large size, the front wings of males about 28 mm (CAS); 21 miles E of Xandel, 750 m, 4 Dec. 1966, Ross and Lorenzen - 1 ♂, 1 ♀ (CAS). **GHANA**: 22 miles S of Bolgatanga, 200 m, 31 Aug. 1966, Ross and Lorenzen - 1 ♂; 55 miles SW of Tamale, 100 m, 1 Sept. 1966, Ross and Lorenzen - 1 ♂ (both CAS). **MALAWI** (then Nyasaland): 4 miles E of Katumbi, 1 460 m, 20 Feb. 1958, Ross and Leech - 1 ♂ with 29 mm front wings, 1 ♀ (CAS); 19 miles N of Kasungu, 1 100 m, 23 Feb. 1958, Ross and Leech - 1 ♂ (CAS). **NIGERIA**: 36 miles NE of Zaria, 720 m, 13 Sept. 1966, Ross and Lorenzen - 1 ♀ (CAS). **TANZANIA** (then Tanganyika): 32 miles SE of Sumbawanga, 1 590 m, 13 Feb. 1958, Ross and Leech - 1 ♂, 1 ♀ (CAS). **UGANDA**: 11 miles SE of Mbarara, 1 350 m, 6 Dec. 1957 - 2 ♂, 3 ♀; 34 miles S of Mbarara, 1 200 m, 7 Dec. 1957 - 2 ♂, 1 ♀, all Ross and Leech (CAS). **ZAÏRE** (then Belgian Congo): 10 miles S of Kapona, 1 570 m, 13 Jan. 1958 - 1 ♀; 34 miles N of Pweto, 1 050 m, 14 Jan. 1958 - 3 ♀; 8 miles W of Luanza, 1 330 m, 15 Jan. 1958 - 1 ♀; 8 miles SW of Pweto, 1 080 m, 15 Jan. 1958 - 1 ♂; Muye Park, Upemba, 1 570 m, 17 Jan. 1958 - 1 ♂, 4 ♀; 4, 17 and 69 miles S of Sampwe, 980-1 000 m, 20-21 Jan. 1958 - 8 ♀; 37 and 39 miles NE of Elisabethville, 1 225 m, 22 Jan. 1958 - 1 ♂, 2 ♀; all Ross and Leech (CAS). **ZAMBIA** (then Northern Rhodesia): Abercorn, 1 600 m, 16 Feb. 1958 - 1 ♀; 10 miles N of Chingola, 1 330 m, 8 Feb. 1958 - 1 ♀; 25 miles SE of Tunduma, 1 400 m, 19 Feb. 1958 - 1 ♂, 1 ♀; all Ross and Leech (CAS); 23 miles N of Nabwe (Broken Hill), 3 800 ft, 3 Feb. 1970, M. Irwin and E. S. Ross - 1 ♂, 2 ♀ (CAS); Karempa, 7 Dec. 1959 - 1 ♂; Solwezi, 5 Dec. 1959 - 1 ♂; 25 miles NW of Chingola, W. Prov., 27 Nov. 1959 - 1 ♀; all three by P. Johnsen (UZM).

#### REFERENCES

- BYERS, G. W. 1971. An illustrated, annotated catalogue of African Mecoptera. *Univ. Kans. Sci. Bull.* **49**: 389-436.

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